Coghlan's, Ltd. – Coghlan's Emergency Drinking Water Germcidal Tablets™

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Device Information

Coghlan's emergency drinking water germicidal tablets contain iodine. The manufacturer that produces these tablets, Wisconsin Pharmacal, also produces Globaline™ for the U.S. Military, and Potable Aqua™, which are identical to Coghlan's iodine tablets. Coghlan's, Ltd., sells two products with Coghlan's iodine tablets, one product consists of iodine tablets only; the other product consists of iodine tablets and neutralizing tablets (ascorbic acid) that remove iodine taste, color, and odor. Fifty iodine tablets are packaged in a small bottle with a vinyl lined screw cap. The cap also has an adhesive seal that allows it to be reused to keep moisture from getting into the bottle. Directions for use require the addition of two tablets to 1 liter of water and cap the water container loosely to allow a small amount of leakage. Wait 5 minutes. Shake the container to allow screw threads on the closure to be moistened then tighten cap. Wait 30 more minutes before drinking. If using neutralizing tablets, add two tablets to 1 liter only after the required wait time for the iodine tablets. Two iodine tablets result in a 16 mg/L iodine concentration in 1 liter. Coghlan's iodine tablets are composed of tetraglycine hydroperiodide, sodium acid pyrophosphate and talc. The disinfection capabilities of iodine have long been recognized and it is widely used as an antiseptic and as an emergency drinking water disinfectant. The device should be stored in a cool dry place and the tablets should be kept dry.

Effectiveness Against Microbial Pathogens

Independent testing using the U.S. Environmental Protection Agency (USEPA) Guide Standard and Protocol for Testing Microbiological Water Purifiers (reference 1) has been conducted with Globaline (references 2 and 3). Because Globaline and Coghlan's iodine tablets are identical products, the results can be applied to Coghlan's iodine tablets. Independent testing using the reference 1 protocol confirms Coghlan's iodine tablets consistently provide a 6-log bacteria and 4-log virus reduction when used as directed. This testing also confirms that Coghlan's iodine tablets do not consistently provide 3-log *Giardia* cyst and *Cryptosporidium* oocyst reduction when used as directed. Coghlan's iodine tablets, when used according to directions, provide a 16 mg/L iodine dosage and a 35 minute contact time resulting in a disinfectant concentration times contact time (CT) of 560 mg-min/L. Coghlan's iodine tablets can provide a 3-log *Giarida*

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cyst inactivation when treating most water quality conditions if contact time is increased beyond the directed 35 minutes. Independent testing data using reference 1 indicated contact times of at least 60 minutes (CT = 960 mg-min/L) achieved a 3-log *Giardia* cyst inactivation (reference 2). Other iodine disinfection studies recommend a CT of at least 720 mg-min/L for a 3-log *Giardia* cyst inactivation (reference 4). To ensure a 3-log *Giardia* cyst inactivation when using Coghlan's iodine tablets, provide at least a 45-60 minute contact time. A 3-log *Cryptosporidium* oocyst inactivation is not realistically achieveable when using Coghlan's iodine tablets. Additional treatment is necessary to remove or inactivate *Cryptosporidium* oocysts. Based on independent data that tested a product identical to Coghlan's iodine tablets under severe conditions required by the USEPA protocol, Coghlan's iodine tablets are given three √s for effectiveness against bacteria and viruses, and an X for effectiveness against *Giardia* cysts and *Cryptosporidium* oocysts (for an explanation of the rating checks click here). The following table summarizes Coghlan's iodine tablets expected performance, evaluation rating, and the mechanism by which the pathogens are reduced:

Table. Expected Performance Against Microbial Pathogens When Used As Directed.

Microbial Pathogen Type	Expected Performance	Evaluation Rating	Inactivation/removal Mechanism
Bacteria	> 6-log	√√√	disinfection
Viruses	> 4-log	√√√	disinfection
Giardia cysts	Not Effective*	X*	-
Cryptosporidium oocysts	Not Effective	X	-

* Recommend at least 45-60 minutes contact time to ensure 3-log *Giardia* cyst inactivation.

Production Capacity

One bottle of Coghlan's iodine tablets treats 25 liters (two tablets per liter of water).

Cleaning, Replacement, End of Life Indicator, Shelf Life

The manufacturer does not provide shelf life recommendations. Once the bottle is opened, the iodine tablets will begin to deteriorate. The tablets can last several months if the bottle is kept tightly closed between use. In general, the potency of the tablets can be determined by their

color. As the tablet deteriorates, the color changes. A fully effective tablet is steel gray. A 50% deteriorated tablet is white to yellowish brown. And a completely deteriorated tablet is deep brown.

Weight and Size

The weight of the Coghlan's iodine tablets bottle is approximately 30 grams. The weight of the neutralizer bottle is approximately 30 grams. The approximate dimensions of each bottle are 5 cm x 2.5 cm (H x Dia).

Cost

Coghlan's iodine tablets alone cost approximately $5.00. Coghlan's iodine tablets and neutralizer tablets cost approximately $10.00.

Device Evaluation

Independent testing using the USEPA Guide Standard and Protocol for Testing Microbiological Water Purifiers (reference 1) has been conducted with Globaline (references 2 and 3). Because Globaline and Coghlan's iodine tablets are identical products, the results can be applied to Coghlan's iodine tablets. Independent testing using the reference 1 protocol confirms Coghlan's iodine tablets consistently provide a 6-log bacteria and 4-log virus reduction when used as directed. This testing also confirms that Coghlan's iodine tablets do not consistently provide 3-log *Giardia* cyst and *Cryptosporidium* oocyst reduction when used as directed. Coghlan's iodine tablets can provide a 3-log Giarida cyst inactivation when more than 60 minutes of wait time is provided. Coghlan's iodine tablets are not effective against *Cryptosporidium* oocysts. Additional treatment such as filtration with a 1 µm absolute filter to reduce *Cryptosporidium* oocysts is necessary. Coghlans' iodine tablets are not expected to cause any adverse health effects when used by healthy adults with no pre-existing thyroid conditions or sensitivity to iodine. Coghlan's iodine tablets are not recommended for use by pregnant women (concern for fetus), people with known hypersensitivity to iodine, people with a history (or family history) of thyroid disease, and people from areas with chronic iodine deficiency (reference 4). Iodine in Coghlans' iodine tablets can cause a medicinal taste and odor, and color the water. The iodine can be neutralized by adding ascorbic acid (available with Coghlan's iodine tablets) or sodium thiosulfate, which will improve the taste, odor, and color. Flavored drink mixes can mask the flavor. Neutralizers and flavor aids should not be added until after recommended contact times are achieved. Use of Coghlan's iodine tablets will not remove or reduce particulate matter.

Advantages

- Independent testing using the USEPA protocol confirms 6-log bacteria and 4-log virus reduction when used as directed.
- Very small and lightweight.
- Simple and inexpensive to use.
- No adverse health effects expected in healthy adults with no iodine sensitivity.

Disadvantages

- Not effective against *Cryptosporidium*. Additional treatment is necessary.
- Not consistently effective against *Giardia* cysts when used as directed. Recommend at least 45-60 minute contact time for adequate *Giardia* cyst reduction.
- Not recommended for use by pregnant women or people with iodine sensitivity.
- Does not reduce or remove particulate matter.
- Can impart color, medicinal taste, and odor.

References

1. USEPA, Registration Division Office of Pesticide Program, Criteria and Standards Division Office of Drinking Water, 1987. *Guide Standard and Protocol for Testing Microbiological Water Purifiers.* Washington, D.C.

2. U.S. Army Natick Research, Development, and Engineering Center, 1993. *Efficacy of Flocculating and Other Emergency Water Purification Tablets.* (NATICK/TR-93/033). Natick, MA. Prepared by Powers, E.M.

3. Gerba, C.P., Johnson, D.C., & Hasan, M.N, 1997. Efficacy of iodine water purification tablets against *Cryptosporidium* oocysts and *Giardia* cysts. *Wilderness and Environmental Medicine*, 8, 96-100.

4. U.S. Army Center for Health Promotion and Preventive Medicine, 2005. *Technical Information Paper; Iodine Disinfection in the Use of Individual Water Purification Devices,* Aberdeen Proving Ground, MD.